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Inheritance, Urbanization, and Political Change in Europe

Mircea Popa

Abstract

Urbanization and the development of middle and working classes has been proposed as a key explanation for political change in the Western world. This article argues that the traditional inheritance systems practiced across Europe have played an important role in the differential development of these urban classes in the period 1700-1900. Inheritance systems which practice some degree of inequality between heirs will lead to more children, generally younger brothers, leaving the land and taking up urban occupations. A statistical analysis of geographical data shows that regions in which such unequal inheritance was practiced were two to three times more likely to develop urban areas after 1700. This claim is robust to a number of challenges, including country fixed effects, and to only looking at Western Europe. An important mechanism through which the divergence may have occurred is illustrated through a quantitative analysis of pairs of brothers in the UK and Romania, two countries with opposing inheritance traditions.

1. Introduction

The literature on the comparative political development of Europe has often put the interaction between social classes (landowners, peasantry, capitalists, workers), or income groups (the rich, the middle class, and the poor) at the forefront of the analysis (Capoccia and Ziblatt 2010). One common factor to these arguments is the key role played by emerging urban groups

including the middle classes, workers, and intellectuals, in demanding and achieving institutional change. Understanding the mechanisms behind the rise of these urban groups is therefore important for understanding the modernization, or lack thereof, of European political systems. This article will put forward an argument for the importance of different inheritance traditions across Europe for the extent of urban development. After discussing some conceptual issues regarding inheritance practices, the article will present quantitative evidence based on geographical information systems (GIS) analysis of European urbanization, as well as on a quantitative biographical analysis of elites under two opposing inheritance systems, in favor of the importance of inheritance practices for social change after 1700.

Following the foundational work of Moore (1966), a number of authors have emphasized the crucial role of new urban classes for democratic development. Rueschemeyer et al. (1992) see democratization as a result of capitalist development enlarging the middle and working classes. Luebbert (1991) explains the formation of liberal, social democratic, and fascist regimes through different alliances being formed between the middle class, workers, and the peasantry. Collier (1999) analyzes the process of democratization as a result of struggles between the working class and elites. Boix (2003) explains democratization through a game-theoretic model featuring groups with differential asset endowments and mobility, and emphasizes the crucial role of the rise of a middle class. Acemoglu and Robinson (2000) present a model in which democratization may occur when the poor manage to solve a collective action problem, which would be easier when they formed an urban working class. Przeworski (2009) similarly conceptualizes the struggle over democratization as one between elites and other social classes, and finally, Ansell and Samuels (2014) see democratization as emerging when rising economic groups demand protection from the state.

If the importance of these new classes is to be taken seriously, the immediate question is then why and how did some countries and regions, and not others, develop them? Beyond

this natural interest in going one step back the causal path, understanding more about the formation of new social classes can help give a better understanding of the relations between these new classes and the old, landed groups. A situation where numerous family connections exist between the parallel landed and urban groups can be conjectured to lead to different outcomes than a situation where the groups form perpetually separate dynasties. Integrating such factors into our theorizing of inter-class relations can be useful, for example, for explaining the toleration and even collaboration between landed elites and capitalists in Britain (Landes 2003), and Prussia (Schonhardt-Bailey 1998).

This article proposes that an important factor which has shaped the formation of non-landed, urban, classes in Europe, has been the different inheritance customs practiced in various regions of the continent. The article will argue that the crucial distinction between systems of equal distribution of assets between at least male children, versus systems where some inequality in inheritance between brothers was tolerated, had important effects on the development of non-landed groups in the 18th and 19th centuries. In regions where equal inheritance was the rule, the incentives for leaving the land for the sons of either the great landowners or the peasantry were lower than the corresponding incentives for children in the regions where a substantial expectation existed for some of them (most often brothers other than the eldest) to not inherit significant amounts of land or property. A direct measure of the extent of such development of non-landed groups is the extent of urbanization, and especially the dynamic of this measure. While urbanization was undoubtedly a multicausal outcome, the empirical evidence presented in the following suggests that this inheritance mechanism was significant enough by itself to warrant its introduction among the factors that have shaped the comparative historical development of the continent.

The first piece of empirical evidence in favor of this hypothesis comes from an analysis of geographical data on inheritance rules and urban growth across Europe, in the period 1700-

1900. Using geographical information systems (GIS) data from Klein Goldewijk et al. (2010, 2011), as well as information on inheritance practices from Todd (1990), the results show that regions with unequal inheritance customs were some two to three times more likely to develop urban areas throughout the 18th and 19th centuries. These results are robust to a set of geographical controls, and more importantly, hold for within-country variation as well. As expected from the theoretical discussion in section three, regions that had higher population growth saw a greater effect of unequal inheritance. The political effects of the two inheritance systems are also illustrated quantitatively: starting from similar baselines, countries with UI systems are shown to have become more democratic throughout the 19th century.

Another piece of quantitative evidence in favor of the theoretical argument will come from an analysis of the career paths of pairs of brothers from the elites of two countries representative of the two inheritance traditions: the United Kingdom and Romania. Using historical records of elite family genealogies, we code the career paths of pairs of at least two brothers, and show that there was no differentiation given by birth order in the career paths of brothers in Romania, but significant differentiation existed between the first-born and younger brothers in the UK, with the younger brothers being more likely to switch to non-agricultural occupations, which confirms that this mechanism was indeed present in these two cases.

2. Discussion of historical inheritance practices and literature review

The practice of distributing the wealth of the parents to all children equally upon death has not, by any means, been universal in European history. Not only did women not share rights of inheritance with their brothers in many societies (Goody 1978), but a practice of unequal distribution of inherited wealth among sons can also be encountered in many instances in the continent's history. Defining an equal or unequal inheritance system is not straightforward, as there are a number of aspects of inequality to take into consideration. We will be focusing on

the distribution between sons, rather than all children, as wealth transfers towards daughters, in the form of dowries at marriage or inheritance at death, are less relevant for our theoretical argument, given that few women in the period under discussion had either the freedom to choose different economic pathways or independent control of their wealth, which are crucial elements in the argument.

Regarding the definition of unequal inheritance among sons, there are a few criteria by which this could be made: A first source of inequality is the existence of the institution of “entail” (*majorat* in French, *mayorazgo* in Spanish), which can be allowed or mandated by law. Entail was the legal procedure which prevented each generation from freely disposing of the land inherited, and it usually encompassed the inability to sell the land, as well as the obligation to pass the land undivided to the first born son. The second source of inequality, even in the absence of entails, and applying to non-landed property as well, is the issue of testamentary freedom—to what extent is a testator able to freely decide how to distribute his or her wealth after death (Beckert 2008), with major differences along this dimension persisting until the present day. Both of these legalistic dimensions however are dominated for the purposes of our argument by the customs actually practiced. That is, the definition of unequal inheritance adopted here is that of a situation where there is a widespread expectation among heirs of a possibility of unequal distribution of inherited wealth, arising from either legal limitations or from the decisions of the testators. Inheritance systems will therefore be categorized into two groups (Sabeian 1978, Todd 1985a): those in which the general practice is the equal distribution of wealth among at least male descendants, and those in which the general practice allows at least some degree of inequality among male descendants. The two groups will be referred in the following by the simplified terms “equal inheritance” (EI), and “unequal inheritance” (UI), although the terms “symmetric” and “asymmetric” have also been used.

A few points regarding the origins and functioning of equal and unequal inheritance practices are relevant for the argument. The first point regards the origins of EI/UI practices, which are important for empirical arguments that rely on the exogeneity of this variable. A number of game-theoretical works have sought to explain why a custom of UI, such as primogeniture, might be adopted. These works point to the advantages of UI systems in terms of minimizing the chance of dynastic extinction and maximizing the chance of upward social mobility for the favored heir (Chu 1991), of serving as signals of parental affection in case the distribution is freely chosen by the parents (Bernheim and Severnov 2003), and of minimizing rent-seeking by potential heirs (Baker and Miceli 2005). In the same vein Bertocchi (2006) presents a theoretical analysis of the effect of industrialization on the shift from primogeniture to equal division. A related discussion is the role of primogeniture in the choosing of heirs to the throne in monarchies. Kokkonen and Sundell (2014) look at the role of primogeniture in the succession to the crown in European dynasties, and argue that it provided a credible commitment by the monarch to reward loyalty, after his or her death.

Empirically, the origins of unequal inheritance customs lie in the Middle Ages (Bloch 2014 pp 200-221). De Long (2003) argues, following Adam Smith, that in England primogeniture arose as a natural consequence of the fact that a fief was granted by the king in return for service, and when the holder died, the optimal choice for the king was for the contract to be continued with a single heir, in order to keep the fief intact. Spring (1997) similarly argues, based on a review of existing literature, that the development of primogeniture in England likely occurred along with the development of the feudal order, but that the precise origins are unknown, and Howell (1978) confirms that by the 12th century the principle of impartible inheritance was in use among the peasantry in Britain. In continental Europe, the origins of UI practices are similarly ancient. Kaser (2002), argues that rules of equal inheritance among males, and dowries for women, can be traced back to the inheritance laws of the Roman

Empire. While in the west of the Empire, Germanic conquest altered some of these practices, in the Eastern part they survived over the millennia (Laiou-Tomadakis 1977 cited in Kaser 2002). After becoming prevalent in Germany, UI customs were spread between the 11th and 14th centuries through colonization by Germanic landlords, and reached as far as Prussia, Bohemia, and Silesia. Le Roy Ladourie (1978) also argues that the inheritance traditions of the various parts of France can be traced to the Middle Ages. EI traditions in parts of Slavic Eastern Europe are connected by Kaser (2002) to the tribal origins of village communities in these regions, taken together with the predominance of slash-and-burn agriculture in the medieval period, which led to all men having equal access to cleared land. While the details of the historical origins of inheritance systems are beyond the scope of this analysis, what is important is the agreement in the literature on their ancient origins, which will strengthen empirical arguments in which the exogeneity of this variable is important.

The second relevant question is on how much inequality and discretion was actually present in the various UI systems. What is important here is that “unequal inheritance” as a causal factor is better understood as the possibility of unequal inheritance, with significant heterogeneity in the extent of this inequality being possible not only between countries or regions, but also between families and generations. Not even the archetypal English system of primogeniture meant that younger sons went completely unprovided for. While the principle that land should pass undivided to the oldest son was general, Spring (1997) argues that the system of “strict settlement” which developed in the 17th century allowed wealth transfers towards younger sons, but also says England had the most extreme form of inheritance inequality in Europe. Landes (2003) argues that the need for such transfers incentivized landowners to practice economy in order to be able to provide for the younger sons, and Cooper (1978) shows that land acquired by a great landowner during his life was often not subject to strict settlement, although Spufford (1978) also shows in her study of Cambridgeshire that wills

most often provided for younger sons as well as daughters from the future profits of the main estate, which was given undivided to the eldest son. In parts of Germany, primogeniture came with the obligation on the part of the brother inheriting the land to provide financial support for his younger brothers (Habbabunk 1955), and distinctions between regions where impartibility of land was universal and regions where some families chose to divide the land equally did exist inside the country (Berkner 1978). In France, before the Revolution, a testator in general could freely dispose of between one half and three quarters of his or her property, only if they wanted, and noble estates could be passed from one generation to the other in a system of entail, but with one third of the property being reserved for younger children (Beckert 2008). Spain, while abolishing entails in 1836, which were practiced among the nobility, still allowed a degree of UI, with for example one son in a family of four sons being allowed to inherit three quarters of a property (Spring 1977). The source of data used in the empirical analysis, from Todd (1990), codes the two systems according to the actual practice which prevailed for the majority of the population, and similar to our use, codes unequal inheritance as the expectation that significant, but not necessarily complete, differentiation would occur between heirs.

The third question, which is relevant for the proposed mechanism through which inheritance practices influence urbanization, deals with how younger sons were expected to provide for themselves in unequal inheritance systems, given that the default “career path”, that of making a living from the land or other assets inherited from parents was not available to them. Their career choices depended on social class. In England, the most common occupations for the younger sons of the gentry and nobility were government employment, sometimes in the colonies, the military, the clergy, and other private employment (Landes 2003, Spring 1997), the latter especially for the sons of the gentry (Wallis and Webb 2011, Howell 1978). For the younger sons of the peasantry, industrial employment became an option

in England in the 19th century (Howell 1978). In Prussia, the military and public administration were the career of choice for the younger sons of landowners (Stern 1977). For peasant younger sons, paid employment, either agricultural or non-agricultural, was the default choice. In Germany and the German- dominated regions of Eastern Europe, younger sons often became household servants (Kaser 2002). Habakkuk (1955) similarly argues that in Bohemia and Silesia younger peasant sons became paid agricultural workers and when the opportunity arose, became industrial and service-sector workers in the cities. This evidence from the historical literature justifies a theoretical approach in which one of the factors linking unequal inheritance to urbanization is through younger siblings taking on paid, possibly non-agricultural occupations.

A final issue to be touched upon is the transition from the various UI systems to the contemporary equal-inheritance systems across Europe. This is relevant because most regions abandoned unequal inheritance practices throughout the late 19th and 20th centuries, which means the arguments here cannot be easily extended to the contemporary world. The data source for coding inheritance types, Todd (1990), refers to the prevalent inheritance custom among the majority of the population between 1500 and 1900, and therefore 1900 will be the latest date at which the effects of traditional inheritance customs are considered.

3. Theory

This section will discuss two complementary reasons why unequal inheritance may stimulate urbanization and the emergence of non-landed occupations, as well as a third, more speculative one. The primary reason is of course that in the absence of a plot of land to work or to extract rents from, the younger sons of both great landowners as well as peasants need to find other occupations, which can possibly, though not necessarily, be non-agricultural. The historical literature on inheritance systems confirms this: Berkner and Mendels (1978) argue

that out-migration from the village is a key result of impartible (unequal) inheritance, while low emigration from the villages should be a basic feature of equal partible inheritance, and Todd (1990) also argues that the need for those without an inheritance to find alternative occupations was a basic feature of unequal inheritance. Pressures for leaving the land can exist in EI systems as well, especially under conditions of population increase, but they will generally be weaker for a host of reasons: It will almost always be the case that a son left with one half or even one third of a property has less incentive to completely abandon agriculture than one left with no land at all. This would clearly be the case when the divided plots are enough by themselves to sustain an acceptable lifestyle, as would generally be the case for families with more substantial properties, which may have disproportionate influence over urbanization or the lack thereof. Even for poor families, in which the division is more likely to make the plot too small to sustain a livelihood, not only does this generally happen later, but the presence of some property still makes it more likely that the owner takes up paid agricultural employment to make up for the shortfall rather than giving up agriculture altogether. Confirming this logic, Todd (1990) argues that the grand exploitation, in which peasants work as sharecroppers or employees for a landlord, was a natural result of fragmentation of peasant wealth under equal inheritance. Moreover, the over-division argument applies much less to homes, which can be divided and extended to a larger extent. Even for dynasties of landless laborers, the prospect of a share of a house as inheritance would act as a strong attractor to the countryside, compared to the absence of housing.

The second, and complementary, reason why UI systems may encourage the development of non-agricultural activities is because undivided plots of land may have higher productivity than fragmented plots. If this is the case, then the share of the population that needs to be engaged in agriculture can be lower, freeing up labor for other activities. The belief that undivided plots are more productive seems to have been offered as an argument in favor

of the primogeniture system in both England and Prussia (Cooper 1978, Howell 1978 for England; Berkner 2008 for Prussia). In a connected argument, Bertocchi (2006) assumes, based on historical evidence, that primogeniture was maintained to improve the efficiency of the estate. Grant (2002) addresses the question directly, using data on agricultural productivity from 19th century Germany. Grant shows that regions that featured primogeniture increased their agricultural productivity faster, and argues a possible explanation for this is the inefficiency of land fragmentation under equal division. Modern empirical research confirms that farm fragmentation is a barrier to productivity-enhancing technological change (Niroula and Thapa 2005, Rahman and Rahman 2009, Manjunatha et al. 2013) and land consolidation is seen by development organizations and governments facing fragmentation as a basic tool for improving agricultural efficiency (Sabates-Wheeler 2002). Superior land productivity would therefore allow the emergence of a demand for labor in the cities, which complements the increased supply which may otherwise be mostly absorbed in the agricultural sector. Connected to this, for the children better-off families there were few such attractive employment opportunities in the countryside, making a move to the city a natural outcome.

To these two reasons, which are quite straightforward, another conjecture could be added: A situation where younger sons of landowners leave agricultural life and join other occupations is more conducive to the landowning class tolerating or encouraging the growth of those non-agricultural sectors of the economy, than one in which they form a perpetually isolated class. When an elite family has interests in non-agricultural sectors through its sons and daughters, these sectors are more likely to be perceived as legitimate additions to the traditional agricultural economy. And as entrenched political actors are likely to be prime opponents of economic transformation (Acemoglu and Robinson 2000b), alleviating this opposition has to be a key component of economic change. There is evidence from the United Kingdom, as well as from Prussia, that this was indeed the case. For Britain, Landes (2003)

emphasizes the great symbolic importance of the possibility of younger sons leaving the gentry and joining the trades. While the number of younger sons joining industry and the commercial world was limited, the existence of such cases gave legitimacy to professional and industrial occupations. Similarly, in Prussia, the military and bureaucracy, which were typical destinations for the younger sons of the *junkers* became prestigious occupations, and therefore legitimate additions to the traditional economy.

This discussion points to the main hypothesis to be tested, namely that UI systems should lead to more urbanization, where urbanization captures the political and economic transformations that arise when a part of the population leaves agriculture. A secondary hypothesis is that an important channel through which this effect is transmitted is through differential occupational specialization of younger sons in UI and EI systems: we expect that UI systems should see younger sons adopting non-agricultural occupations to a greater extent than first-born sons, and no such differentiation in EI systems.

The level of population growth should play a part in determining the extent of the dynamics presented in the previous paragraphs. In a constant-population regime, on average each couple will have one son, and the expected number of younger sons will be zero. Any given couple might have more than zero younger sons, and for these unlucky children the same considerations apply in UI systems, but the extent of the process will be more limited than in a situation of positive population growth. A third hypothesis to emerge from this is that the effect of UI systems on urbanization should be greater in times and in regions of high population growth.

As the connection between the rise of urban classes and democratization has been theorized before, another immediate implication of the theoretical framework is that inheritance traditions should also serve as useful predictors of political outcomes, which is also briefly illustrated in the empirical section.

4. Empirical analysis

GIS data and results

Data on historical urbanization in Europe is available from a number of sources including de Vries (1984), Bairoch (1988), and Chandler (1987). Data from these three sources, together with historical data on population and landcover has been assembled in GIS format by Klein Goldewijk et al. (2010, 2011) (henceforth referred to as the HYDE dataset), and Ellis et al. (2010) (henceforth the Anthromes dataset). The authors of the HYDE GIS dataset have used the urbanization data from de Vries (1984), Bairoch (1988), and Chandler (1987), and national population data from McEvedy and Jones (1978), Livi-Bacci (2007), Maddison (2001), Denevan (1992), and Lahmeyer (2004), together with historical landcover data to model population densities in 1700, 1800, 1900, and 2000. The Anthromes dataset uses inputs from the HYDE data to categorize landcover across the world in the same years, using a 19-point classification ranging from dense urban settlements to wildlands.

The HYDE and Anthromes GIS data are provided as rasters with a resolution of 5 arc-minutes. When using urban development as a dependent variable, we code this as a 1 if the cell is coded as an urban area by Ellis et al. (comprising the subcategories 11- "Urban", and 12- "Mixed settlements" in their 19-point classification), and 0 otherwise. The HYDE data will be used for two control variables indicating population density and population growth; and also for an alternative dependent variable, in which urban population size is used instead of cell urbanization status. This raster data was combined with vector data on European borders, city locations, and subnational ("NUTS") regions from Eurostat (retrieved April 2015).

The information on inheritance rules was obtained from the work of Todd (1985; 1987; 1990; 1999). The main source is Todd (1990), where inheritance types are coded as part of a family-types classification at the granularity of European NUTS-3 subnational regions. This source covers mostly Western Europe—up to the borders of Finland, West Germany, Austria,

and Italy, so this was extended with the information provided in Todd (1999), to include Eastern European regions as well. We coded as unequal inheritance (UI) the NUTS regions identified by Todd (1990, 1999) as such. This include the absolute nuclear and stem family types, including the incomplete stem type in the models in the body of the paper. The equal inheritance types are the egalitarian nuclear, and the communitarian family types. A small number of regions in France, Austria, and Finland, are identified as “mixed” between the two types in Todd (1990), and in the models presented in the body of the paper these are not analyzed. Results coding these regions as either UI or EI are included in the replication materials and are very similar to results presented here. The final inheritance-types and urban areas map is presented in Figure 1.

Todd’s coding of family types has received some critical attention (see Rijpma and Carmichael 2016). However, Rijpma and Carmichael compare Todd’s coding with an alternative coding proposed by Murdock (1967), and show that while the two generally agree on identifying symmetric inheritance practices in a global sample, which is reassuring for the accuracy of both sources. Murdock’s sample, however, has poor coverage in Europe, making it difficult to compare it with Todd’s subnational European data. Another concern about Todd’s coding is that it focuses on inheritance traditions which apply for the great majority of the population, which in some cases ignores the existence of institutions such as *majorat* or *mayorazgo*, which allowed the great nobility to induce a degree of inequality in their inheritance. The empirical section will discuss this, and argue this is unlikely to materially affect the results.

These sources of GIS information were all overlaid as a raster map, using the format of the Anthromes data. This raster grid was then exported as a dataset using software provided by Muller (2005). In this dataset, each map cell becomes an observation, identified by x and y

coordinates and the variables described above are recorded for each such observation. In all, the European land map is described by 125,648 cells (observations).

The basic type of statistical model estimated in Tables 1 and 2 is a logistic regression of the form $C_{xyt} = \text{logistic}(\beta_0 + \beta_1 C_{xyt-} + \beta_2 \text{inherit}_{xy} + \beta_3 X_{xyt} + (\beta_4 C_{xy}) + \varepsilon_{xyt})$. This models the urbanization status of cell (x, y) at time t (1900 in most models) as a function of its urbanization at some point in the past $t-$, of the inheritance type prevalent over cell (x, y) , and of various controls, included in the vector X_{xyt} , and possibly fixed effects C_{xy} . (Models without the control for past urbanization status are also included). The error ε_{xyt} has to be assumed as suffering from spatial autocorrelation, due to the dependence of neighboring cells in the raster map, as is standard with geographical data (Conley 1999). To address this, all models will be presented with standard errors and p-values that use the Conley (1999) spatial autocorrelation correction, implemented in software by Conley (retrieved April 2015). This “sandwich” estimator allows for an arbitrary autocorrelation structure in the residuals (up to order 4 autocorrelation in the models presented in the body, with results allowing for higher-levels autocorrelation being similar and available in the replication materials).

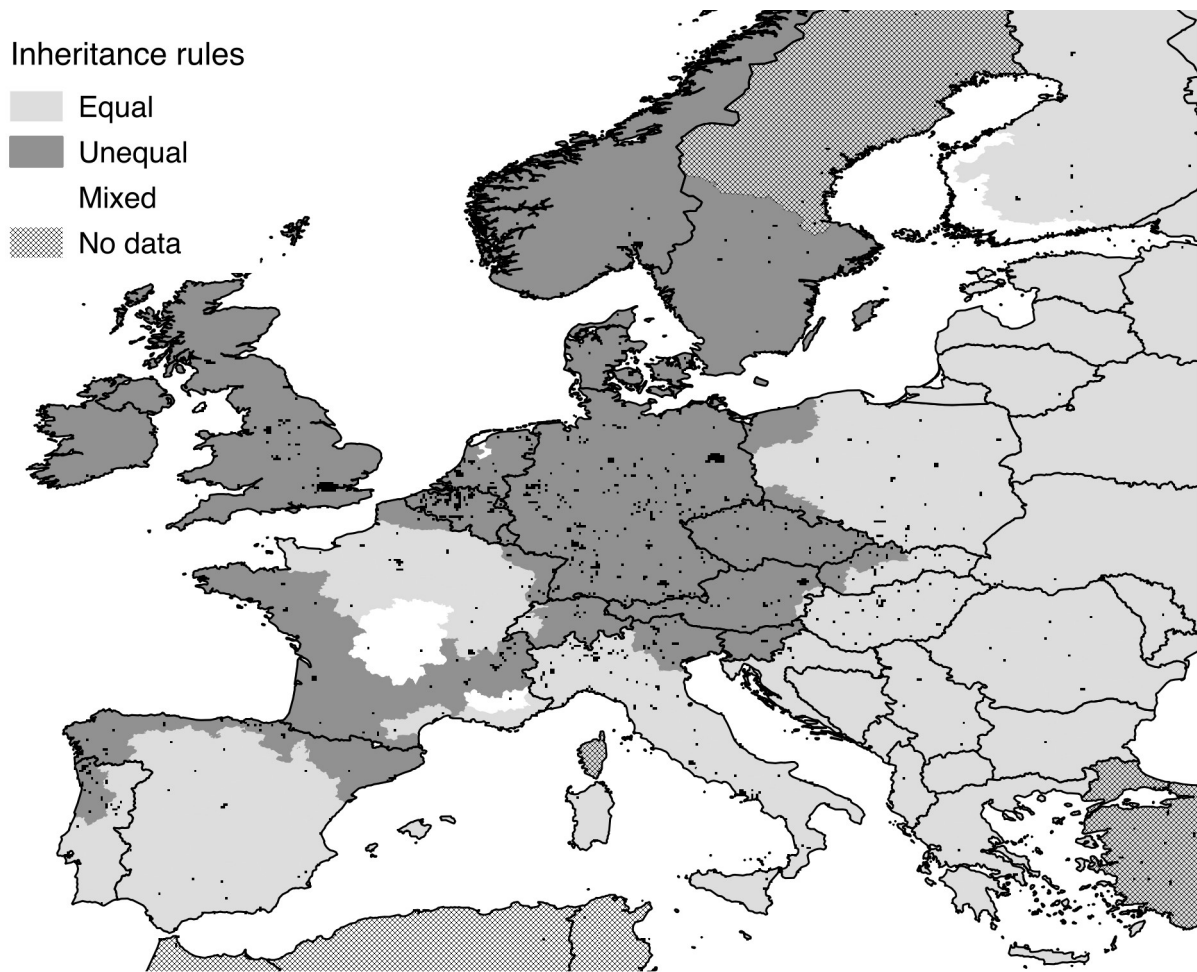


Figure 1: Traditional inheritance practices across Europe

As the treatment variable (inheritance type) is argued by Todd to have been geographically stable for many centuries before 1900, models which include just urbanization at time t as the dependent variable, without past urbanization among the controls, are by themselves instructive. Such models simply show whether urbanization was higher or lower in the treatment group at any given point in time. However, dynamic models in which past urbanization is controlled for have a few advantages, so these will be the main focus in the following. Controlling for urbanization in 1700 in a model where the dependent variable is urbanization in 1900 allows to parse out permanent or long-run factors that favor the urbanization of a region (this includes biological and geographical factors such as availability

of natural resources, waterways, natural harbors, and other such factors which are stable). Also, this allows to control for relevant factors in the baseline period (1700 here) which could have influenced subsequent urbanization, such as for example the population density in the region or rate of population increase.

Fixed-effects models that look at variation inside a country, between regions under two types of inheritance traditions allow to control for any national-level factors might have influenced urbanization patterns. We opted to use fixed effects for current-day (2017) countries, which for Western Europe are the same as those of 1900, with the exception of the separation of Ireland from the UK. In Eastern Europe, this means the use of fixed effects for the regions of the Austria-Hungary which later became independent countries. This allows to control any factors which might be constant at the level of these regions, and cannot, by definition, be less restrictive than using the larger territorial entity.

For each model, the effect of the inheritance variable is presented in terms of both the odds ratio and its logistic regression coefficient. The odds ratios in this case have a simple interpretation, as the proportion between urbanized regions and non-urbanized regions. An odds ratio of 2 means that this proportion doubles under the treatment, corresponding to a very substantial effect.

Model 1 presents a logistic regression of urbanization in 1700 on the unequal inheritance dummy. The results show that unequal inheritance areas had achieved higher urbanization by 1700. Model 2 presents the same model with the dependent variable being urbanization status in 1900. The coefficient and odds ratio on inheritance type increase and become more precisely estimated. This shows that the connection between inheritance type and urbanization became even stronger between 1700 and 1900. While these two results confirm our theoretical expectations, dynamic models which look at urbanization in 1900 controlling for urbanization in 1700 have some advantages, as described in the previous

section, so these are the main focus in the following. Model 3 presents results in which urbanization status in 1700 is controlled for. This baseline result shows that the unequal inheritance regime dummy generates an odds ratio of 3.2, corresponding to a situation where urbanized regions are 3.2 times more likely to be encountered in unequal inheritance areas, which is very substantively significant. Model 4 addresses the concern that if unequal inheritance areas had higher population densities to begin with, they may have been more likely to become urbanized between 1700 and 1900. This specification controls for the estimated population density of the area at the start of the period. Adding this control reduces the size of the coefficient and odds ratio on the inheritance dummy somewhat, but still leaves a very meaningful substantive effect from the unequal inheritance treatment. Another way to deal with this concern is to eliminate low-density areas from the sample, up to a level which leaves the treatment and control groups balanced on this variable. Model 5 presents model 4 estimated on only areas with population densities above 14 per sq km. In this sample the average population densities in the treatment and control groups are almost exactly equal (51.13 vs 51.22). The coefficients here are very similar to those in the previous specification. Similarly, models 17, 18 and 19 are estimated on only a Western European sample. In this sample the two groups again have almost equal average population densities, and the results do not change.

Another possible concern is that unequal inheritance areas had higher population increases between 1700 and 1900. There is no straightforward way to measure the population increase of the area which is relevant for the urbanization of any given map cell. Controlling for the population increase of the cell itself, as in model 6, is endogenous, as the population increase itself reflects urbanization. This would underestimate the true effect of the treatment, because of post-treatment bias. Therefore model 7 controls for population increase at the level of the (present day) country between 1700 and 1900. Given constant levels of population increase, it was still the case that unequal inheritance areas became more urbanized.

	M1	M2	M3	M4	M5	M6	M7	M8	M9
Uneq	.708**	1.181**	1.202**	.650**	.658**	.428**	.651**	.699**	.252
inheritance	(.143)	(.090)	(.086)	(.088)	(.098)	(.098)	(.088)	(.105)	(.190)
Odds ratios	2.031**	3.260**	3.329**	1.915**	1.879**	1.534**	1.917**	2.011**	1.287
Urbaniz. 1700			5.442**	1.881**	1.743**	1.806**	1.913**	2.166**	1.365**
			(.137)	(.140)	(.141)	(.156)	(.141)	(.192)	(.252)
Log(pop				1.590**	1.820**	1.805**	1.576**	1.439**	2.095**
dens 1700)				(.050)	(.056)	(.039)	(.047)	(.052)	(.078)
Log(pop inc)						2.011**			
						(.065)			
Log (entry							.408**		
pop inc)							(.078)		
Pop inc	All	All	All	All	All	All	All	High	Low
Capital incl	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fixed eff	No	No	No	No	No	No	No	No	No
Only W Eur	No	No	No	No	No	No	No	No	No
No. obs.	109,048	109,048	109,048	94,071	30,481	92,221	94,071	53,774	38,447

Models 2-9 are logistic regressions with urbanization in 1900 as the dependent variable. Model 1 is a logistic regression with urbanization in 1700 as the dependent variable. Standard errors presented in parentheses below coefficients. The “Odds ratio” row presents the odds ratios for the inheritance dummy in all models. Standard errors are corrected for arbitrary autocorrelation of up to order 4, using the procedure in Conley (1999). Significance of coefficients: ** = significant at .99 level, * = significant at .95 level.

Table 1: Main results

	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19
Uneq	.645**	.430**	.645**	.633**	.453**	.738**	.558**	.741**	.716**	.680**
inheritance	(.087)	(.099)	(.087)	(.156)	(.173)	(.149)	(.173)	(.103)	(.112)	(.113)
Odds ratios	1.906**	1.538**	1.907**	1.883**	1.573**	2.092**	1.748**	2.099**	2.047	1.974
Urbaniz. 1700	1.805**	1.797**	1.850**	4.758**	1.819**	4.720**	1.828**	5.051**	1.881**	1.862**
	(.139)	(.160)	(.141)	(.204)	(.209)	(.207)	(.215)	(.134)	(.144)	(.147)
Log(pop	1.577**	1.778**	1.563**		2.022**		2.010**		1.489**	1.467**
dens 1700)	(.052)	(.040)	(.049)		(.090)		(.092)		(.060)	(.062)
Log (pop		1.961**								
increase)		(.066)								
Log (entry			.404**						.365**	.391**
pop increase)			(.076)						(.090)	(.087)
Capital	7.213**	5.587**	7.194**							-
	(720)	(.649)	(.717)							
Pop. inc.	All	All	All	All	All	All	All	All	All	All
Capital	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes
Fixed eff.	No	No	No	Yes	Yes	Yes	Yes	No	No	No
Only W Eur	No	No	No	No	No	No	No	Yes	Yes	Yes
No. obs.	94,071	92,221	94,071	30,345	29,541	30,322	29,518	63,324	53,367	53,254

Models 10-19 are logistic regressions with urbanization in 1900 as the dependent variable. The “Odds ratio” row presents the odds ratios for the inheritance dummy in all models. Standard errors are corrected for arbitrary autocorrelation of up to order 4, using the procedure in Conley (1999). Significance of coefficients: ** = significant at .99 level, * = significant at .95 level.

Table 2: Extensions

The theoretical discussion suggests that population increase should determine the degree of pressure for leaving the land under the two regimes. Models 8 and 9 show that this was indeed the case. The sample was split into areas with population growth above and below the mean of the population increase variable. Model 8 shows that indeed, in high-growth areas the unequal inheritance dummy predicts more urbanization, with an odds ratio of around 2. Model 9 shows that in low-growth areas, the coefficient on unequal inheritance is much smaller and not statistically significant.

A capital city can serve as a magnet, especially for jobs in government and administration, for citizens across a country, regardless of whether the capital itself is located in an equal or unequal inheritance area. Separating out the capital city is important because of possible spillovers from areas with a different inheritance rule into the urbanization or non-urbanization of the capital city, and because we want to be sure the results are not given entirely by capitals. Models 10, 11, and 12 repeat the specifications of models 4, 6, and 7, while controlling for an area being a capital city as of 1900. The coefficients remain similar, showing that the effect on urbanization was not due to capital-city effects.

Looking at variation within countries, through fixed-effects models, allows keeping constant any factors that are specific to the country as a whole and therefore these models are more credible in terms of our causal claims. Such factors, which could act as potential omitted variables and are captured by the fixed effect, might include cultural aspects, political-system aspects, and geographical location, among others. In the sample there exists within-country variation in the inheritance rules in present-day Portugal, Spain, France, Italy, Switzerland, Austria, Slovakia, and Poland. Models 13 to 16 present some of the previous models together with country fixed effects. The coefficients in these models, while less precisely estimated due to the lower sample size, remain similar in magnitude to those in the pooled sample and are still statistically significant. This shows that, even while accounting for all factors that might

be constant at the level of the territory of the present-day country, the connection between inheritance systems and urbanization is not broken.

Finally, models 17, 18, and 19 present some of the previous specifications on only a Western-European sample, to make sure that the effects are not generated by the distinction between Eastern and Western Europe. This subsample contains countries including and to the west of Finland, Germany, Austria, and Italy of today. The coefficients are similar in magnitude to those for the full sample. A similar challenge is given by the broad distinction between Germanic, versus Slavic and Latin areas of the continent. While such distinctions are somewhat arbitrary, model 35 in table 9 of the appendix presents a check that controlling for this distinction along with other more speculative controls does not modify the conclusions substantially.

The following sections discuss various robustness checks on these conclusions, the results of which are included in the appendix. An alternative approach to constructing an indicator of urbanization status is taking into account the population of each urban or rural cell. This could provide an even finer-grained measure of the degree of urbanization, at the cost of some additional complexity in interpretation, and of the fact that urban population figures are obviously estimates. Tables 4 and 5 from Appendix present versions of the statistical models from the body of the paper in which the dependent variable is the log of either the urban population per cell, or the rural population per cell. (The values are zero if the cell is rural, and urban respectively). The results here are very similar in nature to those in the main models, which should not be a surprise given that population density and urbanization status are closely correlated.

An alternative approach to modelling the dependence between observations is to use standard errors clustered at the level of the modern-day country, reflecting the fact that error terms within these units are likely correlated. Tables 6 and 7 in the appendix present the main

models with clustered standard errors, and the results do not change meaningfully in terms of significance levels.

The incomplete stem family is characterized by a distribution of inheritance that is possibly more equalitarian than the stem family type, due to increased legal pressures towards equalitarianism. (Todd, however, argues this did not make a large difference in practice.) Table 8 presents the main models on data in which the incomplete stem family type is coded either as .5 or 0 (equal inheritance) as a robustness check. While the magnitude of coefficients is somewhat reduced, the main conclusions are not affected.

Another source of possible measurement error is given by the presence of institutions which allowed the nobility to induce some degree of inequality in inheritance, in situations in which this conflicted with an equalitarian tradition. Todd focuses on traditions applying to the majority of the population, and therefore codes such regions, including Castile, France, and ancient Poland, based on this latter criterion. The extent of this phenomenon remains unexplored in Todd's work, however there is little reason to believe that its existence is biasing the results presented above in a major way. First, this still leaves these territories with an unequal inheritance tradition for the great majority of the population, to which the theoretical mechanisms being proposed still apply. Second, there is little reason to believe that such measurement error is correlated with the outcome, and therefore it is likely that in as much as it is relevant it simply induces attenuation bias in the magnitude of the coefficients.

An emerging literature on urban development has identified a wide variety of factors which have favored urban growth in Europe and elsewhere. (The literature is reviewed in Dincecco and Onorato 2016, 2017, and some of the main references are discussed below). The role of inheritance being proposed here should be seen as a complement to these factors, in a process which was undoubtedly multi-causal. A first set of arguments connects city growth with natural features such as access to rivers, natural trade routes, or coastline (Rokkan 1975,

Tilly 1992, Motamed et al 2014). There is little reason to believe such natural factors are connected to inheritance practices, which would generate omitted variable bias, and moreover the use of urbanization status at the beginning of the period in most models is designed to absorb such permanent features. Another set of arguments (Abramson and Boix 2014, Anderson et al 2015, Motamed et al 2014) connects city growth with agricultural productivity. It should be clear that increases in agricultural output are necessary to sustain urban population, but for the logic of the inheritance argument, this is at most a channel through which the effect of inheritance traditions is transmitted, as the great increases in agricultural productivity from the eighteenth and nineteenth centuries are post-treatment to the inheritance variable. A further set of arguments connects the existence of constraints on the executive to urban growth (De Long and Shleifer 2003, van Zanden et al. 2012). This factor is accounted for in model 35 in the appendix, by using a measure of executive constraints from Marshall et al (2002). Introducing this control does not substantively change the conclusions, and at any rate it is doubtful this element played an exogenous influence towards inheritance systems, which generally developed before and through processes which are not immediately related to representative government institutions. Another set of arguments connects the potential for interaction with the rest of the world, especially after the discovery of the New World, with social and economic development (Nunn and Qian 2011). This will be controlled for in model 35 through a measure of access to coastline, again without changing the results in a substantively relevant manner. A recent contribution (Dincecco and Onorato 2016) connects urban growth with warfare, arguing that war pushed population into cities through a number of channels. This argument however, is only made for the medieval and early modern period (900-1800), as the mechanisms being proposed by Dincecco and Onorato are unlikely to apply to warfare and urban growth in the 19th century. On the same note of avoiding potential relevant covariates, the use of fixed effects in models 14-16 serves to absorb many factors

which were constant at the level of the country, and strengthens the causal argument. A further challenge to the causal argument may arise from possible endogeneity from urbanization to inheritance rules. We have to allow for the possibility that inheritance rules, even if ancient in origin, developed in response to the opportunities to move to the cities. There is no evidence in the historical literature that this was the case, but the possibility remains intriguing in principle. A strong argument against it, however, is that the very limited extent of urbanization in centuries before the eighteenth would have not provided sufficient stimulus for this process to unfold, as cities were simply not large enough anywhere to absorb a significant proportion of the population. A further counterargument is that in a regime of low or close to zero population growth, which prevailed in earlier centuries, the pressures for leaving the land would have been more reduced anyway.

Results for political outcomes

The effects of urbanization and the consequent rise of urban working and middle classes on political reform have been argued many times before. Moore (1966), Collier (1999), Rueschemeyer, Huber, and Stephens (1992), and Acemoglu and Robinson (2000a) are some major references for a line of argumentation that connects social conflict between rising working and/or middle classes and established elites as the driver for political liberalization in Europe. Given the influential intellectual tradition connecting urbanization with democratization, and the connection between inheritance and urbanization that is being proposed here, it is useful to illustrate the connection between such political outcomes and the inheritance variables, as a further support for their importance to the comparative development of the continent. Figures 2 and 3 present the distribution of two indicators of democratization, taken from (Marshall et al. 2002), under the two inheritance regimes, together with formal tests of equality between the groups. Figure 2 presents the distribution of the constraints on the

executive measure presented by Marshall et al. among European countries in their sample as of 1900. (All countries, save the UK are coded as having no constraints in 1800.) The three groups in the boxplot are that of countries which had equal inheritance systems over their entire 1900 territory, that of countries that had a mix of equal and unequal inheritance, and that of countries that had only unequal inheritance. The differences between the EI group and the other two are significant at conventional levels ($p=.005$ and $.002$ respectively), and substantively large (3.23 and 3.32 respectively). This proves that encountering unequal inheritance inside a jurisdiction is indeed associated with a much higher degree of control over the executive developing throughout the 19th century. Similarly, figure 3 presents the distribution of Polity composite democracy scores among the European countries of 1900. Similarly to the previous measure, all countries save the UK and France were coded as fully autocratic in 1800. By 1900, countries that had at least some unequal inheritance regions had developed a significant distance (7.52 and 7.62 points on a 20-point scale) from the EI countries in terms of their Polity democracy score, confirming the theoretical expectations. (The dots in each figure are represent Greece, which is coded as a 10 on the democracy scale in the Polity data in 1900.) While these findings are not the main focus of the argument in this article, they do help justify the relevance of inheritance traditions to social transformation going beyond just urbanization, and serve as further justification of the focus on their study.

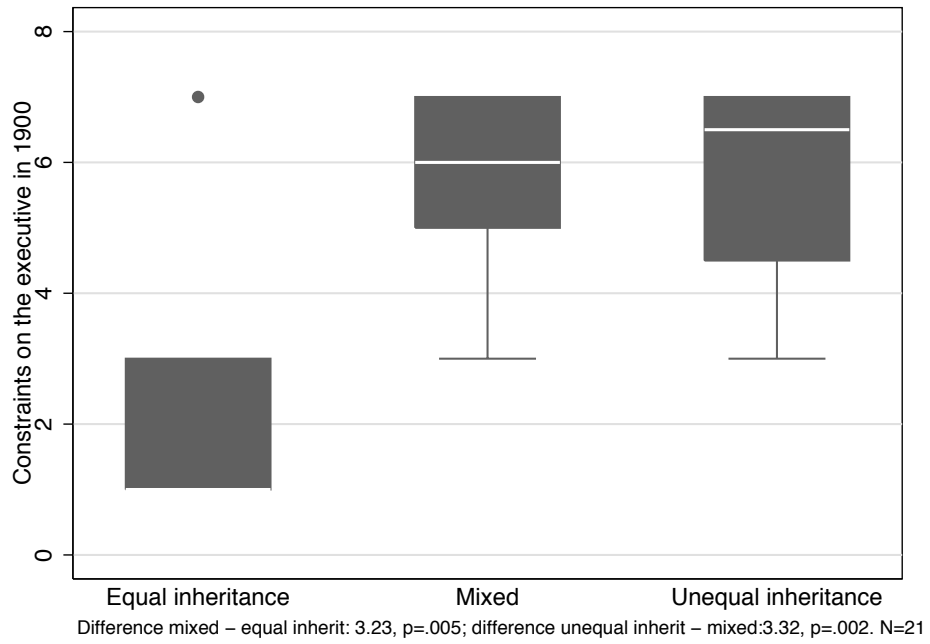


Figure 2: Constraints on the executive in 1900 across inheritance traditions

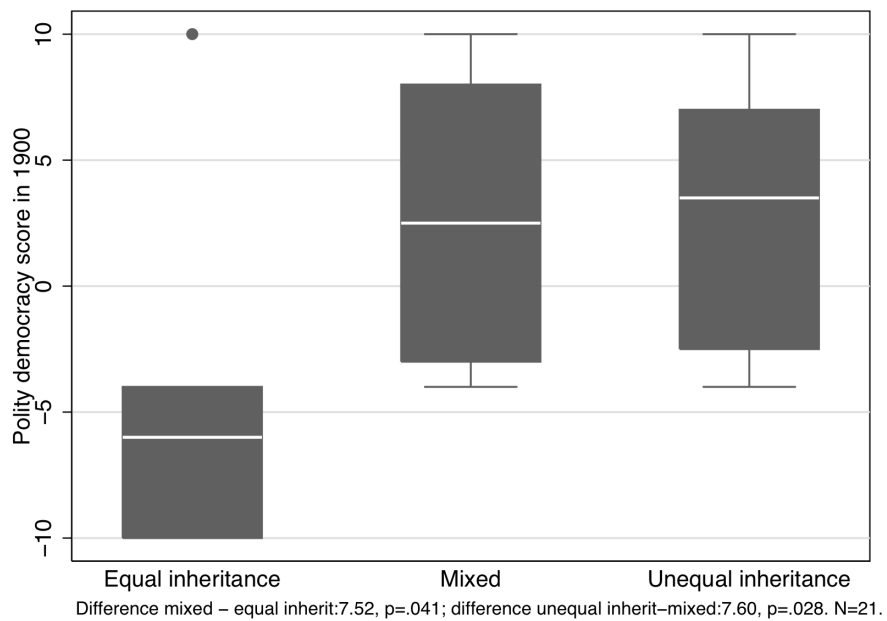


Figure 3: Democracy in 1900 across inheritance traditions

Results on biographical data

Data on differentiations between the occupational choices and sources of income of first-born sons (who inherited most or all of the land in primogeniture systems) and their younger brothers, under the two inheritance traditions, would strengthen our claims. The basic hypothesis regarding the career and occupational paths of first and younger sons that emerges from the theory is that under an unequal inheritance system, younger sons are more likely to be pushed into making a living from occupations other than landholding and farming, which would lead to the development of such nontraditional occupations and therefore to urbanization. Extensive biographical data on families in various European countries during the time period under analysis is generally not available. Genealogical data on elite families is one exception, so we make use of biographical data on elite families in two countries with opposite inheritance rules: the United Kingdom (UK), a classic example of unequal inheritance, and Romania (the principalities of Moldova and Walachia before 1859) a country with a tradition of equal distribution of the wealth among sons. Uncovering differences in the career paths of dynasties in the two countries would serve as a further robustness and plausibility check on the overall argument, as they are a necessary implication of the theoretical framework.

To study differences between first-born and younger brothers in the two countries, we collected comparable samples on the career and occupational paths of pairs of at least two brothers in the period 1700 to roughly 1850. The sources of data for the two cases were two similar volumes containing biographies of aristocratic families. For the UK, the source is Burke's Peerage (1869), which presents the genealogies of members of the peerage in the UK, as of the year of publication, along with short biographical notes on each individual mentioned. In the case of Romania, the data comes from a volume by Lecca (1899), which follows a nearly identical format, and presents biographical data on *boier* (noble) families in the two

principalities of Moldova and Walachia. As both sources attempt an exhaustive listing of aristocratic families, the two samples should be representative of the population of interest.

In both cases we selected from the genealogy pairs of at least two brothers for which it can be established that they were all born after 1700, which survived into adulthood, and for which there is information available beyond just the name. Only pairs where the birth order can be clearly established have been selected. In both cases, pairs of brothers in which any of them are born after 1850 are omitted, to allow for their occupations/career choices to be recorded as adults.

Following these criteria, we were able to record 93 pairs of brothers from Romania, the maximum number possible by parsing the book by Lecca from the first to the last family. Given that information on genealogy and birth order in the British case was recorded more precisely, we were able to collect a corresponding 93 pairs of brothers by taking a sample. Collecting a similar number of cases is useful for maintain comparability between results from the two countries. In both cases, for each pair of brothers, the father's name and "occupation" (to be defined in the following) are recorded, as well as the occupations of all brothers, in order of birth. Occupations are coded in the following categories:

Nothing/property owner. In both the UK and Romania, the default occupation for aristocrats in this period was to be a rentier, deriving income from the ownership of land and other property. In case nothing is mentioned about any professional activities among the ones to be listed below, the individual is coded as having a landed occupation/career path.

Government/politics. In both countries, aristocrats often played a role in politics and government. The extent to which this indicates a non-landed career or not is debatable, therefore two sets of results will be presented. On the one hand, individuals in both countries sometimes developed extensive political or administrative careers and derived substantial incomes from that. On the other hand, a role in politics was often a natural complement to a

landed, rentier, lifestyle and interests, and it is difficult to distinguish between the two situations given the available data. The models in table 3 therefore present two sets of results, in which a government occupation is coded as either non-landed, or landed, to reflect this uncertainty. In the UK, an individual is coded as “government” if he played a role in the executive or administration at any point in his career or was a member of the (elected) House of Commons. All men holding a peerage became by default members of the House of Lords, so this will not be recorded as a career choice. In the case of Romania, recording governmental or political work is somewhat more challenging, due to the different political structure. On the one hand, especially in the 19th century, there are individuals in the sample who clearly have a role in the administration, executive, or are members of parliament, and such individuals can reliably be coded as “government”. On the other hand, as it was the case in many continental European countries, nobility was often associated with carrying a title indicative of an administrative role at the royal court. In some instances such titles did really correspond to work in government, in others they were merely honorary titles carried by individuals who continued to live as rentiers. To get around the difficulty of deciding on such occupations, Table 3 presents both models where they are coded as governmental occupations and models where they are not.

Military. In both cases, nobles and their sons often had careers in the military, and this is recorded separately.

Law. This will only be applicable in the UK case, as there are no individuals practicing law in the Romanian sample. If the individual is listed as an esquire or judge, or had another position in the judicial system, he is recorded under “law”.

Private/other. This includes all other jobs that were neither in government, nor the military, nor in law.

In the case of the UK, emigrating to another part of the empire is also recorded separately.

We first code as “traditional occupation” individuals who were only landowners in the UK, and individuals who were either only landowners or only landowners plus having a titled position but no clear political function in Romania. In addition, in a second set of models, we also code a government role as landed. All other career pathways are coded as non-traditional. The final sample contains 93 sets of brothers from each country, for a total of 303 individuals in the UK and 253 in Romania. When coding government occupations as non-landed, approximately the same percentage of sons are counted as having non-landed occupations in both countries (61.4% vs 60.8% in Romania), largely due to the fact that all sons disproportionately participated in political roles in Romania. If coding these roles as landed, then the proportion changes substantially, with 51.8% non-landed in the UK and 26.88% in Romania. The truth is likely somewhere in the middle, indicating that overall sons were on average more likely to take non-landed occupations in the UK than in Romania, as would be expected.

Table 3 presents the results of linear regressions of a dummy indicating landed occupation on either a dummy for younger (second and later) son, or individual dummies for sons 2 and later, with the first-born as the baseline. The results show that in the UK, younger sons were as a whole some 25-31 percentage points less likely to have had a purely landed occupation, and this difference is highly statistically significant. Model UK2 shows that second sons were some 20 percentage points less likely to have a landed occupation than first-born ones, third sons, some 30 percentage points less likely, and so on. (Output is suppressed after the 5th son, and there are few such cases in the sample). Similarly, model UK 4 shows even larger differences between first and later sons.

	UK1	UK2	UK3	UK4	Ro1	Ro2	Ro3	Ro4	Ro5	Ro6
Younger son	-.249** (.059)		-.316** (.060)		.012 (.054)		.000 (.064)		-.063 (.058)	
2nd son		-.208** (.070)		-.285** (.071)		.010 (.062)		.021 (.072)		-.043 (.056)
3rd son		-.306** (.078)		-.369** (.079)		.032 (.075)		.004 (.087)		-.063 (.079)
4th son		-.287** (.096)		-.339** (.098)		-.017 (.117)		-.057 (.137)		-.105 (.123)
5th son		-.274* (.136)		-.274* (.138)		-.017 (.193)		-.191 (.226)		-.371 (.204)
No. obs.	303	303	303	303	253	253	253	253	253	253

Linear regressions (linear probability models) of landed occupation on a dummy variable for younger son, or dummy variables for birth order number with first-born as baseline category. Output suppressed for sixth and later sons. Models UK3, UK4, Ro5 and Ro6 define government employment as landed, and the other models define it as non-landed. In models Ro1 and Ro2, landed occupation is defined to exclude traditional titled positions. In models Ro3 and Ro4, landed occupation is defined to include traditional titled positions. Significance levels: **: significant at the .99 level, *: significant at the .05 level.

Table 3: Birth order and occupations in the UK and Romania

In the case of Romania, several kinds of models are presented, depending on how the traditional titled positions, and also government positions in general, are coded. Ro1 and Ro2 exclude individuals who held traditional titles from the landed group, while Ro3 and Ro4 include individuals who are recorded as only holding these occupations as landed-occupation individuals, while in both cases counting government jobs as non-landed. Models Ro5 and Ro6 count government jobs as landed (and do not record traditional titles as government employment). Regardless of the coding choice and the model estimated, there is virtually no difference between first and later sons in terms of occupational specialization, as would be expected from the theoretical argument.

Conclusions

This article has presented evidence that unequal inheritance traditions have favored urban development and therefore political change, in modern Europe. The evidence in favor of this the effect is quite robust. Fixed effects models that look at “within” variation inside the

regions corresponding to a present-day country show that regions with UI traditions were significantly more likely to urbanize. Similarly, the effect is present when looking at just a Western European sample, and when leaving out capital cities. The analysis of elite families in the UK and Romania shows that one hypothesized mechanism behind this effect, based on differential economic specializations of first and younger sons under the two traditions is indeed encountered in the data. This body of evidence shows that traditional inheritance rules have indeed played a significant role in the comparative political development of Europe, and encourages further attention to such anthropological variables in explaining political phenomena.

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Appendix (Not intended for publication)

	M20	M21	M22	M23	M24	M25	M26	M27
Uneq inheritance	.028** (.006)	.149** (.013)	.125** (.010)	.157** (.014)	.282** (.023)	.038** (.009)	.116** (.009)	.08** (.024)
Log(cell urban pop 1700)			.809** (.030)	.809 (.030)	1.05** (.028)	.644** (.038)	.702** (.030)	.712** (.040)
Log (cntry pop Capital)				.058** (.009)			8.200** (.380)	
Pop inc	All	All	All	All	High	Low	All	All
Fixed eff	No	No	No	No	No	No	No	Yes
Only W Eur	No	No	No	No	No	No	No	No
No. obs.	109,048	109,048	109,048	109,048	47,427	61,621	109,048	30,345

Models 21-27 are linear regressions with log cell urban population in 1900 as the dependent variable. Model 20 is a linear regression with log cell urban population in 1700 as the dependent variable. Standard errors presented in parentheses below coefficients. Standard errors are corrected for arbitrary autocorrelation of up to order 4, using the procedure in Conley (1999). Significance of coefficients: ** = significant at .99 level, * = significant at .95 level.

Table 4: Main models with cell urban population as dependent variable

	M29	M30	M31	M32	M33	M34
Uneq inheritance	-.344** (.051)	-.708** (.021)	-.145** (.017)	-.581** (.032)	-.556** (.020)	-.699** (.021)
Rural p. 1700		.884** (.030)	.884** (.004)	.973** (.006)	.985** (.010)	.883** (.005)
Log (cntry pop inc)			1.018** (.014)			
Capital						-5.79** (.429)
Pop inc	All	All	All	High	Low	All
Fixed eff	No	No	No	No	No	No
Only W Eur	No	No	No	No	No	No
No. obs.	105,694	105,694	105,694	44,073	61,621	105,694

Models 30-34 are linear regressions with log cell rural population in 1900 as the dependent variable. Model 29 is a linear regression with log cell rural population in 1700 as the dependent variable. Standard errors presented in parentheses below coefficients. Standard errors are corrected for arbitrary autocorrelation of up to order 4, using the procedure in Conley (1999). Significance of coefficients: ** = significant at .99 level, * = significant at .95 level.

Table 5: Main models with cell rural population as dependent variable

	M1c	M2c	M3c	M4c	M5c	M6c	M7c	M8c	M9c
Uneq inheritance	.700 (.665)	1.181** (.440)	1.202** (.364)	.650** (.189)	.658** (.182)	.428 (.367)	.651** (.198)	.699* (.362)	.252 (.351)
Odds ratios	2.031	3.260**	3.329**	1.915**	1.879**	1.534	1.917**	2.011*	1.287
Urbaniz. 1700			5.442** (.42)	1.881** (.520)	1.743** (.524)	1.806** (.467)	1.913** (.547)	2.166** (.417)	1.365* (.587)
Log(pop dens 1700)				1.590** (.202)	1.820** (.201)	1.805** (.083)	1.576** (.191)	1.439** (.219)	2.095** (.182)
Log (pop inc)						2.011** (.193)			
Log (cntry pop inc)							.408 (.301)		
Pop inc	All	All	All	All	All	All	All	High	Low
Capital incl	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fixed eff	No	No	No	No	No	No	No	No	No
Only W Eur	No	No	No	No	No	No	No	No	No
No. obs.	109,048	109,048	109,048	94,071	30,481	92,221	94,071	53,774	38,447

Models 1c - 9c repeat models 1-9 from Table 1, while presenting standard errors clustered at the level of the present-day country in parentheses. Significance of coefficients: ** = significant at .99 level, * = significant at .95 level.

Table 6: Models from table 1 with clustered standard errors

	M10c	M11c	M12c	M13c	M14c	M15c	M16c	M17c	M18c	M19
Uneq inheritance	.645** (.188)	.430 (.373)	.645** (.197)	.633* (.300)	.453* (.190)	.738* (.294)	.558** (.175)	.741. (.454)	.716** (.213)	.680* (.217)
Odds ratios	1.906**	1.538	1.907**	1.883*	1.573*	2.092*	1.748**	2.099	2.047	1.97
Urbaniz. 1700	1.805** (.546)	1.797** (.488)	1.850** (.579)	4.758** (.931)	1.819 (.939)	4.720** (.956)	1.828** (.993)	5.051** (.493)	1.881** (.602)	1.862* (.642)
Log(pop dens 1700)	1.577** (.210)	1.778** (.086)	1.563** (.199)		2.022** (.314)		2.010** (.317)		1.489** (.256)	1.467* (.268)
Log (pop increase)		1.961** (.207)								
Log (cntry pop increase)			.404 (.312)						.365 (.371)	.391** (.375)
Capital	7.213** (.876)	5.587** (.729)	7.194** (.858)							-
Pop. inc.	All	All	All	All	All	All	All	All	All	All
Capital	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes
Fixed eff.	No	No	No	Yes	Yes	Yes	Yes	No	No	No
Only W Eur	No	No	No	No	No	No	No	Yes	Yes	Yes

No. obs.	94,071	92,221	94,071	30,345	29,541	30,322	29,518	63,324	53,367	53,25
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Models 10c -19c repeat models 10-19 from Table 2, while presenting standard errors clustered at the level of the present-day country in parentheses. Significance of coefficients: ** = significant at .99 level, * = significant at .95 level, . = significant at the .10 level.

Table 7: Models from table 2 with clustered standard errors

	M1i50	M2i50	M3i50	M7i50	M1i00	M2i00	M3i00	M7i00
Uneq inheritance	.616** (.140)	1.023** (.084)	1.049** (.081)	548.** (.88)	.487** (.140)	.813** (.089)	.831** (.087)	.379** (.089)
Urbaniz. 1700			5.436** (.134)	1.897** (.141)			5.432** (.113)	1.879** .141
Log(pop dens 1700)				1.580** (.047)				1.584** (.047)
Log (cntry pop inc)				.402 (.079)				.402 (.081)
Pop inc	All	All	All	All	All	All	All	All
Capital incl	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fixed eff	No	No	No	No	No	No	No	No
Only W Eur	No	No	No	No	No	No	No	No
No. obs.	109,048	109,048	109,048	94,071	109,048	109,048	109,048	94,071

Models M1i50-M7i50 repeat models M1-M7 from table 1, while coding the inheritance tradition of the incomplete stem family as .5 instead of 1. Models M1i00-M7i00 repeat models M1-M7 from table 1, while coding the inheritance tradition of the incomplete stem family as 0 instead of 1. Standard errors are corrected for arbitrary autocorrelation of up to order 4, using the procedure in Conley (1999). Significance of coefficients: ** = significant at .99 level, * = significant at .95 level.

Table 8: Main models with alternative coding of inheritance for the incomplete stem family

M35	
Uneq inheritance	.592** (.137)
Urbaniz. 1700	1.880** (.149)
Log(pop dens 1700)	1.628** (.048)
Log(coast to area)	.258** (.058)
Constraints on exec	-.189** (.030)
Germanic	.329** (.129)
Pop inc	All
Capital incl	Yes
Fixed eff	No
Only W Eur	No
No. obs.	93,314

Model M35 is a logistic regression with urbanization in 1900 as the dependent variable. Standard errors presented in parentheses below coefficients. Standard errors are corrected for arbitrary autocorrelation of up to order 4, using the procedure in Conley (1999). Ireland, the UK, Netherlands, Germany, Denmark, Sweden, Norway, and Germany are coded as Germanic (1), and Belgium and Switzerland are coded as 0.5. Significance of coefficients: ** = significant at .99 level, * = significant at .95 level.

Table 9: Additional results